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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,789	01/21/2005	Yuji Sato	26487U	1960

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EXAMINER	
SCHWARTZ, DARREN B	
ART UNIT	PAPER NUMBER
4193	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/521,789	SATO ET AL.	
	Examiner	Art Unit	
	DARREN B. SCHWARTZ	4193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 January 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01-21-05 04-29-05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because in Figure 10, elt 900b is not functionally equivalent to 900a; specifically variable "i" is not properly initialized. Figure 10, elt 900c is not a functioning example of 900a; specifically the lines of code denoting "N--" and "if(i<N)break;" 900c will fail to work as described. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 11-12 recite "said watermark verification code is made **identical**." It is unclear as to what the watermark verification code is identical to.

Any claim not specifically addressed above is being rejected as incorporating the deficiencies of a claim upon which it depends.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 7, 8, 11, 19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 7, 8, 11, 19 are directed to software, per se. The body of the claim is directed to the logic steps of the program itself, that is, descriptive material per se, non-functional descriptive material, and is not statutory because it is not a physical "thing" nor a statutory process. Such claims do not define any structural and functional interrelationships between the computer program and other claimed aspects of the invention which permit the computer program's functionality to be realized. Since a computer program is merely a set of instructions capable of being executed by a computer, the program itself is not a process without the computer-readable medium needed to realize the computer program's functionality. In

contrast, a claimed computer- readable medium encoded with a computer program defines structural and functional interrelationships between the computer program and the medium which permit the computer program's functionality to be realized, and is thus statutory. Warmerdam, 33 F.3d at 1361,31 USPQ2d at 1760. In re Sarkar, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978). See MPEP § 2106(IV)(B)(1)(a).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 10 and 19 rejected under 35 U.S.C. 102(b) as being anticipated by Collberg, Christian S., "Watermarking, Tamper-Proofing, and Obfuscation – Tools for Software Protection," hereinafter referred to as Collberg.

Re claims 10 and 19: Collberg teaches a watermark insertion method wherein: watermark that differs for each program distribution destination is inserted in a program (page 7, column 2, lines 3-8); and a periphery of an insertion location of said watermark or entire said program is converted while maintaining specifications (page 741, column 1, bullets 1-5).

8. Claims 9 and 11 rejected under 35 U.S.C. 102(b) as being anticipated by Ward, Stephan et al. (WO 00/54128), hereinafter referred to as Ward.

Re claims 9 and 11: Ward teaches a watermark insertion method/program (Abstract: lines 1-2) wherein: watermark that differs for each program distribution destination is inserted in said program and said watermark is used (Fig 3, elts 201,203 and 309; page 17, lines 16-18); said program is prevented from operating correctly when said watermark is tampered with (page 16, step 2; page 22, lines 1-18); and watermark verification code that is identical regardless of said distribution destination is inserted in said program (Figs 1, 2 & 4: elt 103; page 20, lines 5-10).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-6, 12-14, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collberg, Christian S., "Watermarking, Tamper-Proofing, and Obfuscation – Tools for Software Protection, hereinafter referred to as Collberg,

Re claim 1: Collberg teaches a watermark insertion apparatus comprising: a watermark insertion section that inserts in a program watermark that differs for each program distribution destination (page 737, column 1, lines 29-32); and a code insertion section that inserts in said program watermark verification code that prevents said program from operating correctly when said watermark is tampered with (page 737, Fig 3, process (b); page 737, bullet 2; The secret S can be directed to anything within

program P, including, but not limited to, a watermark or fingerprint); wherein said watermark verification code is made identical regardless of said distribution destination (page 737, left column, lines 29-32; page 741, lines 1-4 of sec 3.2 teaches "static" watermarking).

However, Collberg does not teach integrating the two processes of watermarking and tamper-proofing (see Fig 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Collberg's inventions together for the purpose of protecting software (see Abstract), as taught by Collberg.

Re claim 2: Collberg teaches all the limitations of claim 1 as previously discussed. Collberg further teaches said watermark is generated from ID information that uniquely determines a program distribution destination (page 740, column 2, line 3-8; page 741, column 1, lines 18-20).

Re claim 3: Collberg teaches all the limitations of claim 1 as previously discussed. Collberg further teaches comprising a function insertion section that defines a function that outputs a predetermined constant from said watermark and inserts an expression that assigns said function to a variable in said program; wherein said watermark verification code is a conditional branch that determines whether said variable and said constant are equal, and when said variable and said constant are not equal halts said program; and said watermark verification code is made identical regardless of said distribution destination (page 741, column 1, bullet 4; page 743, column 2, steps a and b).

Re claim 4: Collberg teaches all the limitations of claim 1 as previously discussed. Collberg further teaches said watermark verification code is necessary for said program to be made to operate correctly (page 737, bullet 2; The secret S can be directed to anything within program P, including, but not limited to, a watermark or fingerprint).

Re claim 5: Collberg teaches all the limitations of claim 1 as previously discussed. Collberg further teaches said watermark verification code has inserted a calculation expression that does not affect a decision statement of a decision branch generated from said watermark in said decision branch extracted from said program (page 743, section 3.4; the program topology is the watermark/fingerprint; as such, the water/fingerprint is not determined by a decision statement, but by topology).

Re claim 6: Collberg teaches a watermark extraction apparatus comprising: a program input section that inputs a program in which the watermark insertion apparatus according to claim 1 has inserted said watermark and said watermark verification code; and a watermark detection section that extracts said watermark from said program and generates ID information that uniquely identifies said distribution destination based on said watermark (see claim 1); wherein a distribution destination is identified based on generated said ID information (page 740, column 2, line 3-8; page 741, column 1, lines 18-20).

Re claim 12: Collberg teaches a watermark insertion apparatus comprising: a watermark insertion section that inserts in a program watermark that differs for each program distribution destination (page 737, column 1, lines 29-32); and a conversion

section that converts a part other than a location at which said watermark is inserted while maintaining specifications of said program (page 741-742: section 3.2: ¶3 and steps a,b and c). Collberg teaches program obfuscation via a watermark graph; the watermark is preserved and the program is obfuscated.

However, Collberg does not teach integrating the two processes of watermarking and obfuscation (see Fig 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Collberg's inventions together for the purpose of protecting software (see Abstract), as taught by Collberg.

Re claim 13: Collberg teaches all the limitations of claim 12 as previously discussed. Collberg further teaches said conversion section inserts an execution code pair that does not affect specifications in a part other than a location at which said watermark is inserted (page 737, bullet 3 and page 738, bullet 1).

Re claim 14: Collberg teaches all the limitations of claim 12 as previously discussed. Collberg further teaches identification information is stored that indicates an insertion location of said watermark (page 737, bullet 1 and page 741, bullet 1).

Re claim 16: Collberg teaches all the limitations of claim 12 as previously discussed. Collberg further teaches said conversion section performs obfuscating so that specifications are not affected in a part other than a location at which said watermark is inserted (page 737, bullet 3 and page 738, bullet 1; page 741-742: section 3.2: ¶3 and steps a,b and c). Collberg teaches program obfuscation via a watermark graph; the watermark is preserved and the program is obfuscated.

Re claim 17: Collberg teaches all the limitations of claim 12 as previously discussed. Claim 17 is rejected under similar grounds as those described in claim 6.

11. Claims 7, 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collberg, Christian S., "Watermarking, Tamper-Proofing, and Obfuscation – Tools for Software Protection, hereinafter referred to as Collberg, in view of Palsberg, Jens et al., "Experience with Software Watermarking," hereinafter referred to as Palsberg.

Re claim 7: Collberg teaches all the limitations of claim 1 as previously discussed. Collberg further teaches a program input section that inputs a program in which the watermark insertion apparatus according to claim 1 has inserted said watermark and said watermark verification code (see claim 1).

Collberg does not teach a watermark detection section that extracts said watermark from said program and generates ID information that uniquely identifies said distribution destination based on said watermark; wherein a distribution destination is identified based on generated said ID information.

Palsberg teaches a watermark detection section that extracts said watermark from said program and generates ID information that uniquely identifies said distribution destination based on said watermark wherein a distribution destination is identified based on generated said ID information (page 1, bullet 1 and bullet 4; page 5, entire section 2.3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Collberg reference to extract said watermark

from a program P, as taught by Palsberg, for the purpose of determining if a particular program P' has been stolen or illegal reproduced (see Collberg: page 737, column 2, lines 29-32).

Re claim 15: Collberg teaches all the limitations of claim 12 as previously discussed.

Collberg does not teach said identification information is a method name or line number.

Palsberg teaches said identification information is a method name or line number (page 5, lines 1-3 of section 2.3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Collberg reference to store the identification information as a class name or the like, as taught by Palsberg, for the purpose of locating watermark/fingerprint/identification information in the program.

Re claim 18: Collberg teaches all the limitations of claim 17 as previously discussed. Collberg further teaches a watermark extraction apparatus comprising: a watermark detection section that obtains said identification information (page 737, column 1, lines 29-32), identifies a watermark insertion location from said identification information (page 737, bullet 1 and page 741, bullet 1), and extracts said watermark from only identified said watermark insertion location (page 1, bullet 1 and bullet 4; page 5, entire section 2.3); wherein a distribution destination is identified based on extracted said watermark (page 740, column 2, line 3-8; page 741, column 1, lines 18-20).

Collberg does not teach a program input section that inputs a program in which the watermark insertion apparatus according to claim 15 has inserted said watermark.

Palsberg teaches a program input section that inputs a program in which the watermark insertion apparatus according to claim 15 has inserted said watermark (page 5, section 2.3 "Watermark Retrieval).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Collberg reference to extract said watermark from a program P, as taught by Palsberg, for the purpose of determining if a particular program P' has been stolen or illegal reproduced (see Collberg: page 737, column 2, lines 29-32).

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Collberg, Christian S., "Watermarking, Tamper-Proofing, and Obfuscation – Tools for Software Protection, hereinafter referred to as Collberg, in view of Palsberg, Jens et al., "Experience with Software Watermarking," hereinafter referred to as Palsberg, in further view of Horne et al. (U.S. Pat Pub. 2003/0023856 A1), hereinafter referred to as Horne.

Re claim 8: Collberg in view of Palsberg teach all the limitations of claim 7 as previously discussed.

Collberg in view of Palsberg do not teach said watermark insertion apparatus is provided at said distribution destination.

Horne teaches said watermark insertion apparatus is provided at said distribution destination (¶67; self-checking means is embedded in the program when it is compiled).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the combination of Collberg and Palsberg reference to insert the watermark at the destination, as taught by Horne, for the purpose of securing the program.

13. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collberg, Christian S., "Watermarking, Tamper-Proofing, and Obfuscation – Tools for Software Protection, hereinafter referred to as Collberg, in view of Davidson et al. (U.S. Pat 5559884 A), hereinafter referred to as Davidson.

14. Re claim 20: Collberg teaches all the limitations of claim 12 as previously discussed. Collberg does not teach said conversion section converts a sequence of a part that is a part other than a location at which said watermark is inserted and is a part that does not affect specifications even if said sequence is switched around.

Davidson teaches Collberg does not teach said conversion section converts a sequence of a part that is a part other than a location at which said watermark is inserted and is a part that does not affect specifications even if said sequence is switched around (whole Abstract; col 2, lines 61-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Collberg reference to include a watermark and obfuscate the program without destroying/damaging the watermark, as taught by Davidson, for the purpose of simultaneously providing a watermark/fingerprint and obfuscation.

Re claim 21: Collberg in view of Davidson teach all the limitations of claim 20 as previously discussed. Collberg in view of Davidson further teaches historical information [execution flow] on a part that does not affect said specifications is held, and using said historical information [execution flow], conversion of a part that does not affect said specifications is made to differ for each distribution destination (whole Abstract; col 2, lines 61-67).

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darren B. Schwartz whose telephone number is 571-270-3850. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Nguyen can be reached on 571-272-1753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DS

/Long Nguyen/
Supervisory Patent Examiner
Art Unit 4193